

**A STUDY OF METHOMYL RESIDUE
ON
SWEET CORN EARS**

**RIVERSIDE COUNTY
MAY 1975**

**Keith T. Maddy
Agricultural Chemicals & Feed
1220 N Street
Sacramento, CA 95814**

PERSONNEL

**California Department of Food and Agriculture
Agricultural Chemicals and Feed and Laboratory Services:**

Keith T. Maddy - Toxicologist
A. Scott Fredrickson - Agricultural Chemist
Peter Schlocker - Agricultural Chemist
Charles Kahn - Agricultural Inspector
Gary W. Sprock - Agricultural Inspector

Riverside County Agricultural Commissioner's Officer:

Ruben M. Arias - County Agricultural Inspector

METHOMYL RESIDUE ON SWEET CORN
RIVERSIDE COUNTY, MAY 1975

Methomyl (S-Methyl-N-[methylcarbamoyl] oxy] thioacetimidate) is a broad spectrum carbamate insecticide registered for use on a wide variety of field crops. Marketed under the trade names of Lannate (E. I. duPont de Nemours) and Nudrin (Shell Chemical), methomyl is one of the most effective pesticides available against corn ear worm. Other chemicals useful against corn ear worm on sweet corn are carbaryl and Gardona. The Lannate label requires a dosage rate of .25-.45 lbs. actual methomyl per acre applied every one to three days from the time ear silk first appears until it ceases growth. The label specifies a 0 day preharvest interval for corn picked for the fresh market and a 3 day preharvest interval for foliage to be fed to animals.

In order to discover possible hazards to workers hand picking sweet corn or handling corn in packing houses, corn ear samples were obtained and analyzed for methomyl residue.

Sampling Procedure

Three corn fields located near Thermal, Riverside County, California were sampled. Samples consisted of scissor clippings of the foliar "tabs" attached to the husks at the top of the ear collected while walking diagonally across the corn field. Samples were taken hourly for the first three hours and at 8 and 24 hours after the application in two of the fields, once at 8 hours after the application in the third field.

The applications were made with boom sprayers mounted on high wheel tractors. The spray nozzles were suspended from the boom such that they dangled below the top of the corn with the spray directed at the level at which the ears were growing.

Analysis

The samples were extracted in a California Department of Food and Agriculture mobile laboratory stationed at the Riverside County Center in Indio. The extracts were frozen for later analysis in Sacramento. Total residues were extracted from a single blended sample. Surface residues were removed from duplicate samples in an aqueous solution containing a surfactant. The samples remaining were then blended to obtain the penetrated residues. The methomyl was extracted from the sample with ethyl acetate, cleaned up with water and hexane partitioning, and extracted with chloroform. The methomyl was converted to the oxime by alkali-hydrolysis. The oxime was analyzed by gas chromatography.

The gas chromatograph was a Tracor model 550 equipped with a flame photometric detector in its sulfur mode under the following conditions:

Column - FFAP, 100/120 Chrom W (HP); 6 ft. x 2 mm. I.D.

Column temperature - 160°C.

Injector temperature - 220°C.

Detector temperature - 220°C.

Flow Rates:

N ₂	- 80 ml/min.
H ₂	- 100 ml/min.
Air	- 80 ml/min.
Retention Time	- 1.8 min.

Results

Weather conditions were clear and warm over the study period with highs near 100° and lows at 60°F (see Table 2). The study data is summarized in Table 1. The reason or reasons for the extremely erratic results are not readily apparent. They may result from variations in application, sampling or analytical techniques or may be a combination of all three. The data however, suggests significant methomyl residues persist on sweet corn beyond 24 hours.

In addition, sweet corn from two crops was sampled at a packing house. The two crops received 3 and 5 successive Lannate applications of 1/3 pounds actual methomyl per acre with the last application coming 16 and 8 days before harvest respectively. The respective residue amounts found on the foliar husk tabs were .9 and .2 ppm. No residue was detected on the husks. The residue tolerance for methomyl on sweet corn ears is 0.1 ppm.

Conclusions

Additional field sampling of methomyl treated sweet corn is needed. Care should be taken to minimize differences in sampling techniques between individual collectors. Recovery samples should be inserted periodically during all analysis to aid in standardizing techniques between analysts assigned to these tests and give an indication of daily reproducibility of results.

Table 1.: Methomyl Residue Found on Corn Husks
At 1 Through 28 Hours After Application

One-half pounds Lannate 90 percent/40 gallons/acre (.45 methomyl/acre).

<u>Hours After Application</u>	<u>Methomyl PPM</u>		
	<u>Surface</u>	<u>Penetrated</u>	<u>Total</u>
1	59.	30	36
2	42.	24	33
5	31.	14	134
8	38.	12	27
28	29.	24	34
28 (husk sample)	3.3	0	--

One and one-third pints Lannate L/35 gallons volume/acre (.3 pounds methomyl/acre).

<u>Hours After Application</u>	<u>Methomyl PPM</u>		
	<u>Surface</u>	<u>Penetrated</u>	<u>Total</u>
1	75	33	66
2	54	22	136
3	54	28	93
7	60	33	84
26	60	39	29

One and one-third pints Shell Nudrin/33 gallons/acre (.3 pounds methomyl per acre).

<u>Hours After Application</u>	<u>Methomyl PPM</u>		
	<u>Surface</u>	<u>Penetrated</u>	<u>Total</u>
8	65.	37.	90.

TABLE 2.
DAILY TEMPERATURE AND PRECIPITATION
OBSERVATIONS MADE BY FEDERAL AVIATION ADMINISTRATION
THERMAL AIRPORT, RIVERSIDE COUNTY, CALIFORNIA

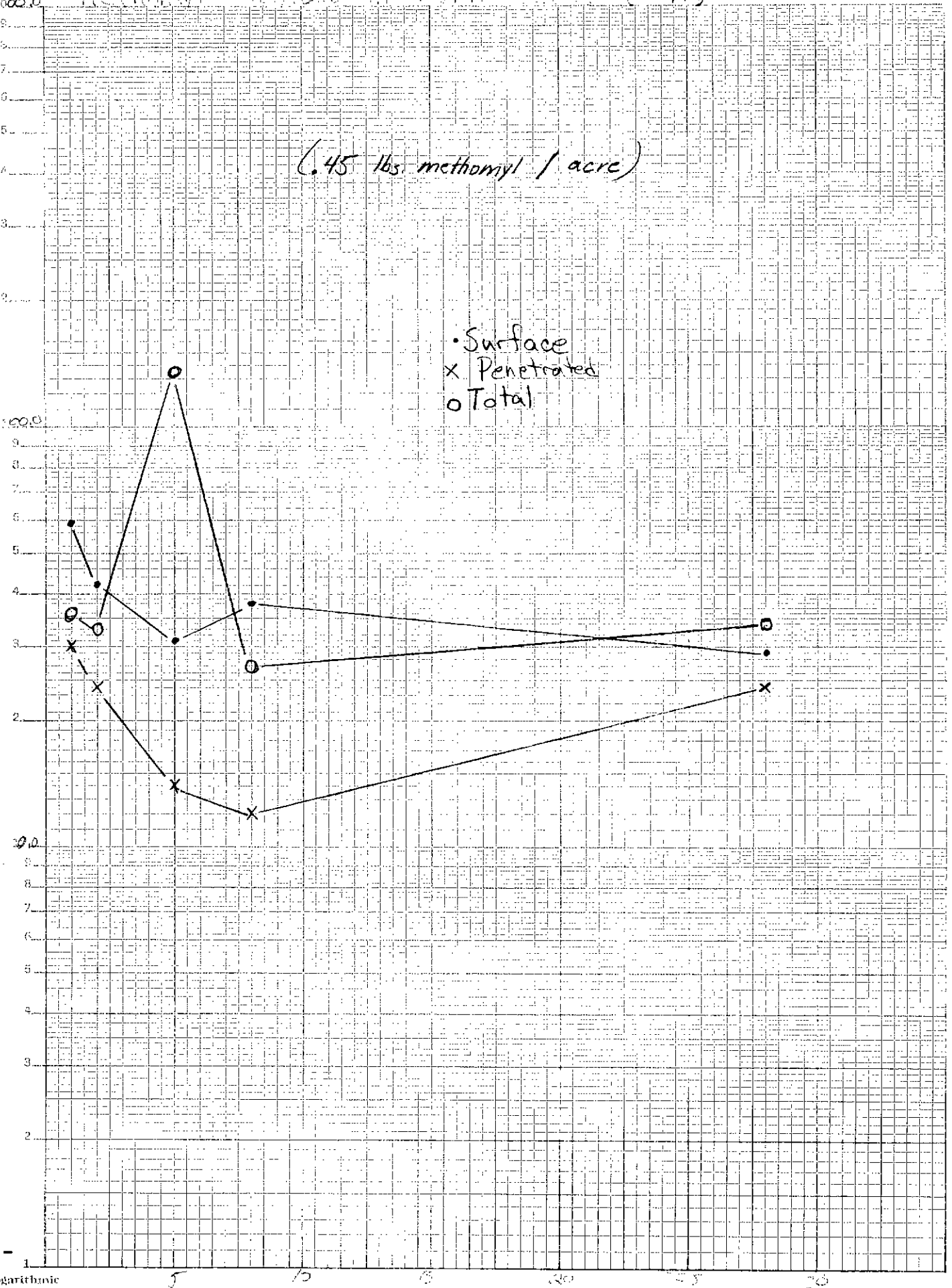
<u>Date</u>	<u>Temperatures (°F)</u>		<u>Precipitation (Inches)</u>
	<u>Max</u>	<u>Min</u>	<u>24 hour amounts</u> <u>observation time 8:00 a.m.</u>
5-12	103	58	
13	102	58	
14	97	58	
15	97	60	
16	89	59	
17	87	57	

TOTAL .00

Methomyl Residue on Corn Root (1971)

(.45 lbs methomyl / acre)

• Surface
x Penetrated
o Total

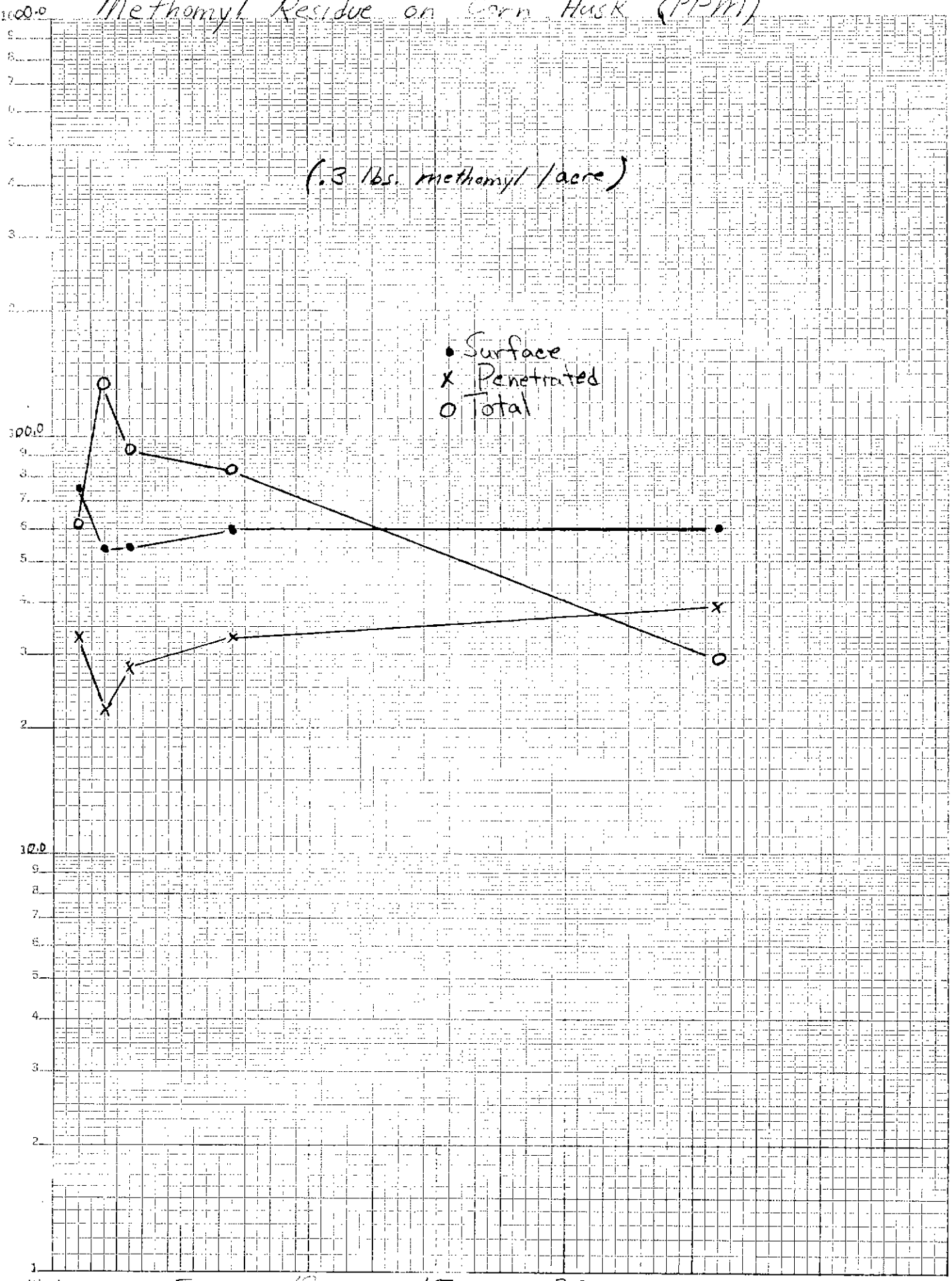


Hours After Application

Methomyl Residue on Corn Husk (PPM)

(.3 lbs. methomyl / acre)

- Surface
- x Penetrated
- o Total



Hours After Application